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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,167	07/30/2003	James Albert Matthews	10030278-1	1888

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AGILENT TECHNOLOGIES, INC.

Legal Department, DL429

Intellectual Property Administration

P.O. Box 7599

Loveland, CO 80537-0599

EXAMINER

YAM, STEPHEN K

ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 08/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/632,167	Applicant(s) MATTHEWS, JAMES ALBERT	
	Examiner Stephen Yam	Art Unit 2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

In Paragraph 19, line 1, "the sensing element 307" should be changed to "the sensing element 207", as Fig. 3 has not been presented yet.

Appropriate correction is required.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the sensing element as at least one of the layers in the diffractive optical element (in Claims 8 and 15) and the optical device as refractive or reflective (in Claims 17 and 18) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an

Art Unit: 2878

application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 301, 305 (Fig. 3B). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claims 2, 3, and 13 are objected to because of the following informalities:

In Claim 2, a period should be placed at the end of the claim.

In Claim 3, the comma at the end of the claim should be placed with a period.

In Claim 13, "a photovoltaic PN junction" lacks proper antecedent basis.

Art Unit: 2878

Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-9 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Lott US Patent No. 5,892,786.

Regarding Claim 1, Lott teaches (see Fig. 5) an apparatus comprising a substrate (see Fig. 5), a sensing element ("pnp HPT detector"), and an optical device ((p) DBR above the detector) formed over the substrate.

Regarding Claim 2, Lott teaches the optical device is a diffractive optical element (since a Bragg grating is a diffractive element).

Regarding Claim 3, Lott teaches the diffractive optical element is a plurality of stacked layers of optically transmissive material upon the substrate (see Fig. 5 and Col. 6, lines 34-64).

Regarding Claim 4, Lott teaches (see Fig. 5) a light source (generating laser output in the AQ active region) positioned to transmit light through the sensing element and the diffractive optical element.

Regarding Claim 5, Lott teaches a control circuit coupled to the sensing element for measuring the response of the sensing element to incident light, and for controlling the light source (see Col. 2, lines 13-19).

Regarding Claim 6, Lott teaches the light source as a laser (see Col. 2, lines 60-61).

Regarding Claim 7, Lott teaches the resistance of the sensing element responsive to incident light (since a PIN photodiode is taught for use as the detector- see Col. 8, lines 54-62, and a photodiode operates by providing variable resistance dependent on the amount of incident light).

Regarding Claim 8, Lott teaches the sensing element is at least one of the layers in the diffractive optical element (see Col. 4, lines 38-41 and Col. 7, lines 34-36).

Regarding Claim 9, Lott teaches the sensing element is adjacent to the diffractive optical element (see Fig. 5).

Regarding Claim 19, Lott teaches the temperature of the sensing element is responsive to light (since all objects increase temperature to some degree when impacted by laser energy).

7. Claims 1, 2, and 17-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Morris, Jr. et al. US Patent No. 6,452,669.

Regarding Claim 1, Morris, Jr. et al. teach (see Fig. 4a) an apparatus, comprising: a substrate (60), a sensing element (20) that is responsive to incident light (see Col. 3, lines 1-8),

Art Unit: 2878

including at least one layer of optically transmissive material formed over the substrate (see Col. 2, lines 54-61), and an optical device (30) formed over the substrate (see Fig. 4a).

Regarding Claim 2, Morris, Jr et al. teach the optical device is a diffractive optical element (see Col. 2, lines 65-67).

Regarding Claims 17 and 18, Morris, Jr. et al. teach the optical device is refractive or reflective (see Col. 2, lines 65-67).

Regarding Claim 19, Morris, Jr. et al. teach the temperature of the sensing element is responsive to light (since all objects increase temperature to some degree when impacted by laser energy).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 3-7 and 9-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morris, Jr et al. in view of Lott.

Regarding Claim 3, Morris, Jr. et al. teach the apparatus in Claim 2, according to the appropriate paragraph above. Morris, Jr. et al. do not teach the diffractive optical element as a plurality of stacked layers of optically transmissive material upon the substrate. Lott teaches (see Fig. 5) a similar apparatus, with a diffractive optical element ((p) DBR above the detector) as a plurality of stacked layers of optically transmissive material upon the substrate (see Fig. 5 and

Art Unit: 2878

Col. 6, lines 34-64). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the diffractive optical element as a plurality of stacked layers of optically transmissive material upon the substrate, as taught by Lott, in the apparatus of Morris, Jr. et al., to provide further gain for the laser and increase the optical output.

Regarding Claim 4, Morris, Jr. et al. teach (see Fig. 3a) a light source (10) positioned to transmit light through the sensing element and the diffractive optical element.

Regarding Claim 5, Morris, Jr. et al. teach a control circuit coupled to the sensing element for measuring the response of the sensing element to incident light, and for controlling the light source (see Col. 1, lines 20-25).

Regarding Claim 6, Morris, Jr. et al. teach the light source is a laser (see Col. 2, lines 50-52).

Regarding Claim 7, Morris, Jr. et al. teach the resistance of the sensing element is responsive to incident light (since a constant voltage is applied to the circuit and the current through the photodiode is altered in response to the amount of incident light, the resistance must change, according to the basic electrical formula $Voltage = Current \times Resistance$ - see Col. 3, lines 5-8).

Regarding Claim 9 Morris, Jr. et al. teach (see Fig. 4a) the sensing element is adjacent to the diffractive optical element.

Regarding Claim 10, Morris, Jr. et al. teach a first and second contact on the sensing element for measuring the resistance of the sensing element (to receive the voltage and provide a flowing photocurrent through the photodiode- see Col. 3, lines 1-8).

Art Unit: 2878

Regarding Claim 11, Morris, Jr. et al. teach the optically transmissive material includes a semiconductor (see Col. 2, lines 58-61).

Regarding Claim 12, Morris, Jr. et al. in view of Lott teach the apparatus in Claim 3, according to the appropriate paragraph above. Morris, Jr. et al. also teach the sensing element including two layers of optically transmissive material that form a photovoltaic PIN junction ("vertical configuration"- see Col. 3, lines 1-4). Morris, Jr. et al. do not teach a photovoltaic PN junction. It is well known in the art to substitute between a PN junction and PIN junction, depending on the desired operating characteristics and design considerations. It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a PN junction in the apparatus of Morris, Jr. et al. in view of Lott, to provide a simpler design with less layers when less detection sensitivity is required.

Regarding Claim 13, Morris, Jr. et al. in view of Lott teach the apparatus in Claim 12, according to the appropriate paragraph above. Morris, Jr. et al. do not teach the substrate as one of the layers that form a photovoltaic PN junction. It is well known in the art to provide a substrate as one of the layers in a PN junction (either a P-type substrate with a stacked N-type layer or an N-type substrate with a stacked P-type layer). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the bottom layer in the vertical stacked PIN photodiode as a substrate, in the apparatus of Morris, Jr. et al. in view of Lott, to provide additional support for the detector and the optical element.

Regarding Claim 14, Morris, Jr. et al. teach a first contact on a first layer (either P or N) of the junction (since the photocurrent flows between P and N in the junction, there is a contact on the P layer and a contact on the N layer to enable the circuit through the photodiode), a

Art Unit: 2878

second contact (on the other of the P or N) on a second layer of the junction, wherein the first and second contacts are used to measure an electrical characteristic (resistance) of the junction (since a constant voltage is applied to the circuit and the current through the photodiode is altered in response to the amount of incident light, the resistance must change, according to the basic electrical formula $Voltage = Current \times Resistance$ - see Col. 3, lines 5-8).

Regarding Claim 15, Morris, Jr. et al. in view of Lott teach the apparatus in Claim 12, according to the appropriate paragraph above. Morris, Jr. et al. do not teach the sensing element as at least one of the layers in the diffractive optical element. Lott teaches the sensing element as at least one of the layers in the diffractive optical element (see Col. 4, lines 38-41 and Col. 7, lines 34-36). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the sensing element as at least one of the layers in the diffractive optical element, as taught by Lott, in the apparatus of Morris, Jr. et al. in view of Lott, to provide a more compact and integrated configuration for easier manufacturing.

Regarding Claim 16, Morris, Jr. et al. teach the sensing element adjacent to the diffractive optical element (see Fig. 4a).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Severn US Pre-grant Publication No. 2003/0106988, teaches a transparent photo-detector device for monitoring of a laser.

Mahlein et al. US Patent No. 4,815,081, teaches a laser monitor device with a photodetector and a Bragg grating following the photodetector.

Palmer US Patent No. 3,878,105, teaches a transparent laser monitor.

Wang US Patent No. 6,693,268, teaches a laser monitoring device with a stacked photodetector and Bragg grating.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Yam whose telephone number is (571)272-2449. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571)272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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THANH X. LUU
PATENT EXAMINER